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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/750,444	12/31/2003	Jeung-Hie Choi	51876P555	1775

8791 7590 02/02/2007  
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EXAMINER
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EISEN, ALEXANDER

ART UNIT	PAPER NUMBER
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2629

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/02/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary**

Application No.

10/750,444

Applicant(s)

CHOI, JEUNG-HIE

Examiner

Alexander Eisen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 15 November 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-3,6-8 and 10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3,6-8 and 10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

### DETAILED ACTION

1. The Applicant's response necessitated the withdrawal of the objection to claim 9 and the rejection under 35USC 112(2) of claims 7 and 9. The new grounds of rejection necessitated by the amendment to claims follow.

#### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. **Claim 1** is rejected under 35 U.S.C. 103(a) as being unpatentable over Kurashima et al., hereinafter Kurashima, (Pub. No.: US 2003/0063041 A1, reference of record) in view of Toba, (USPub No. 2002/0137551).

With respect to **Claim 1**, Kurashima discloses a display apparatus (*See figure 1*), comprising a plurality of display panels (*See figure 3, elements 3A and 4A*), each showing different displays (*[0010]*), a single display panel driving unit for commonly operating the display panels (*See figure 3, single display panel driving unit: IC 7; [0074], lines 5-9*), and a connection means for physically and electrically inter-connecting the display panel driving unit with the display panels (*figure 3, connection means: element 8b; [0059], lines 7-9*).

Kurashima does not disclose that the display panel includes a display panel driver shared by the display panels, and a display path control unit for controlling the display panel driver by performing a switching operation to operate a corresponding one of the display panels.

Toba, however, teaches such arrangement (FIG. 7), wherein the display panel includes a display panel driver 25 shared by the display panels 5 and 11, and wherein a display path control unit (switches SW1 and SW2) 27, 28 are controlling the display panel driver 25 by performing a switching operation to operate a corresponding one of the display panels 5 or 11 (paragraph [0092]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time when the invention was made in view of Toba to modify Kurashima so that the display panel would include a display panel driver shared by the display panels and a display path control unit for controlling the display panel driver by performing a switching operation to operate a corresponding one of the display panels, because it would that would simplify the control of the displays (see the last 8 lines of paragraph [0092]), and also for the obvious benefit of using one driving circuit instead of two.

3. **Claim 2** is rejected under 35 U.S.C. 103(a) as being unpatentable over Kurashima in view of Toba and further in view of Anila et al. (reference of record).

With respect to **Claim 2**, Kurashima and Toba disclose the display apparatus as recited in claim 1, wherein the display panels includes a first display panel (*See figure 3, element 3A*) and a second display panel (*element 4A*), and rear sides of the first and second display panels face each other ([0063]).

None of the above teach that the display panel driving unit disposed between the first and the second display panels.

Antila teaches a display panel driving unit (*See figure 3, element Dr*) disposed between the first (*element D1*) and second (*element D2*) display panels.

It would have been obvious for a person of ordinary skill in the art at the time the invention was made to have a display panel driving unit disposed between a first and second display panel, as taught by Antila, to the display apparatus of Kurashima-Toba so as to reduce the wire connections since the two displays are closer to the driver circuit.

4. **Claim 3** is rejected under 35 U.S.C. 103(a) as being unpatentable over Kurashima in view of Toba.

With respect to **Claim 3**, Kurashima and Toba do not teach the connection means is formed using a tape carrier package method. Official Notice is taken that both the concept and the advantages of providing for displays connection means formation using a tape carrier package method in display apparatus' are well known and expected in the art. It would have been obvious to have connections means formed using a tape carrier package method in Kurashima as these formation methods are known to provide reduced pitch, thin package profiles, and smaller footprint on the printed circuit board without compromising performance.

5. **Claims 6-7** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kurashima in view of Toba, as applied to claim 1 above, and further in view of Kou (reference of record).

With respect to **Claim 6**, Kurashima and Toba disclose the display apparatus as recited in claim 1, but fail to mention that the display panel driving unit further comprises a CPU interface control unit for controlling constitution elements included in the display panel driving unit by receiving a command from an external host or a central processing unit, a display panel control unit for controlling the display panel with an external control signal transmitted through the CPU interface control unit or an independent port, a memory unit for storing data displayed on the display panels, an X or an Y address decoder for selecting a corresponding address of the

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memory unit by decoding an encoding signal outputted from the display panel control unit, a register unit for informing each independent operation condition of the display panels, a timing control unit for controlling a point of time for decoding, latching and displaying a data for the selected display panel by the information obtained from the register unit, a line address decoder for decoding an address for the data of the corresponding display panel at a line unit by responding to an output of the timing control unit, a latch unit for latching the data corresponding to the address decoded at the line unit, wherein the data is transferred from the memory unit, and a voltage generation unit for supplying a power voltage for operating each display panel.

Kou teaches a CPU interface control unit (*See figure 2, element 30*) for controlling constitution elements included in the display panel driving unit by receiving a command from an external host (*host computer; column 5, lines 38-40*), a display panel control unit (*element 32; column 5, lines 57-62*) for controlling the display panel with an external control signal transmitted through the CPU interface control unit or an independent port, a memory unit for storing data displayed on the display panels (*element 36*), an address decoder (*column 5, lines 43-49; note that the address decoder maybe a an X, Y or X and Y address decoder*) for selecting a corresponding address of the memory unit by decoding an encoding signal outputted from the display panel control unit, a register unit (*element 40: data serializer is equivalent to the register unit; column 6, lines 49-59*) for informing each independent operation condition of the display panels, a timing control unit (*element 58; column 7, lines 44-52*) for controlling a point of time for decoding, latching and displaying a data for the selected display panel by the information obtained from the register unit, a line address decoder for decoding an address for the data of the corresponding display panel at a line unit by responding to an output of the timing control unit

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*(please note again column 5, lines 43-49; In order to be able to provide data to the display panel where each row is scanned it is necessary to have a line address decoder for decoding an address for a particular row), a latch unit (note that the latch unit is equivalent to input/output buffers; column 5, lines 47-49) for latching the data corresponding to the address decoded at the line unit, wherein the data is transferred from the memory unit, and a voltage generation unit (element 60: power controller is equivalent to the voltage generation unit) for supplying a power voltage for operating each display panel (column 9, lines 65-67; column 10 lines 1-3 and lines 7-9).*

It would have been obvious for a person of ordinary skill in the art at the time the invention was made to have a CPU interface control unit, a display panel control unit, a memory unit, an address decoder, a register unit, a timing control unit, a line address decoder, a latch unit, and a voltage generation unit, as taught by Kou, to the display apparatus of Kurashima, so as to provide a mechanism for simultaneously driving a plurality of displays which refreshes each of the displays at an optimal refresh rate for that display (*Kou: column 4, lines 41-44*) and to improve performance of both displays (*Kou: column 4, lines 45-46*).

With respect to **Claim 7**, Kurashima and Toba disclose the display apparatus as recited in claim 6, but do not disclose that the display panels share the X or Y address decoders, the line address decoder, the voltage generation unit, the memory unit and register unit during a concurrent and cooperative operation.

Kou teaches the shared X or Y address decoders, shared line address decoder, shared voltage generation unit, shared memory unit and a shared register unit during concurrent and cooperative operation (*column 4, line 62 to column 5, line 11; note that the drive signals are*

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*provided to a plurality of displays by one controller, the controller being element 16: display controller).*

It would have been obvious for a person of ordinary skill in the art at the time the invention was made to have shared X or Y address decoders, a shared line address decoder, a shared voltage generation unit, a shared memory unit and a shared register unit during concurrent and cooperative operation, as taught by Kou, to the display apparatus of Kurashima, so as to provide a mechanism for simultaneously driving a plurality of displays which refreshes each of the displays at an optimal refresh rate for that display (*Kou: column 4, lines 41-44*) and to improve performance of both displays (*Kou: column 4, lines 45-46*).

6. **Claim 8** is rejected under 35 U.S.C. 103(a) as being unpatentable over Kurashima in view of Toba and Kou as applied to claim 6 above, and further in view of Nikawa et al. (Pub. No.: US 2002/0111200 A1).

With respect to **Claim 8**, Kurashima, Toba and Kou disclose the display apparatus as recited in claim 6. None of the above teach the voltage generation unit comprises a voltage converter and a DC/DC booster controlled by on-off states of the first and second display panels.

Nikawa teaches a voltage generation unit (*See figure 4, element 27*) comprising a voltage converter ([0032]) and a DC/DC booster.

Nikawa modifies the display apparatus of Kurashima and Kou by replacing the power controller of Kou with the power source of Nikawa such that the voltage generation unit is controlled by the on-off states of the first and second display panels of Kurashima (*note that the on-off states are equivalent to whether a scanning signal is supplied to a display of Kurashima: [0087]*).



It would have been obvious for a person of ordinary skill in the art at the time the invention was made to have a voltage generation unit comprised of a voltage converter and a DC/DC booster controlled by on-off states of the first and second display panels, as taught by Nikawa, to the display apparatus of Kurashima as modified by Kou, so as to eliminate unnecessary power consumption and to provide maximum operating efficiency ([0015]).

7. **Claim 10** is rejected under 35 U.S.C. 103(a) as being unpatentable over Kurashima in view of Toba, as applied to claim 1 above, and further in view of Kin, JP 2001-067049.

With respect to **Claim 10**, Kurashima and Toba disclose the display apparatus as recited in claim 1, but do not teach that the display panel driving unit is packaged in a flexible “U” or “S” shape.

Kin teaches dual display arrangement (displays 200 and 300 in FIGS, 4 and 5) having a display driving unit 100 and connected with each other by means of flexible cables FPC, which is packaged in the “U” type shape.

It would have been obvious to one of ordinary skill in the art at the time when the invention was made that the dual display arrangement in Kurashima-Toba combination can be packaged in a similar way as taught by Kin, i.e. in the “U” shape with reasonable expectation of success and without requiring undue experimentation (note that flexible wiring boards 8 connecting displays and driving unit in the Kurashima are very similar to those of Kin) .

#### ***Response to Arguments***

8. Applicant's arguments with respect to claims 1-3, 6-8 and 10 have been considered but are believed to be answered by, and therefore moot in view of, the new ground(s) of rejection.

*Conclusion*

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexander Eisen whose telephone number is (571) 272-7687. The examiner can normally be reached on M-F (9:00-5:00).

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

A handwritten signature in black ink, appearing to read 'Alexander Eisen', is positioned to the left of the typed name.

Alexander Eisen  
SPE  
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1 February 2007